

TWO NEW SPECIES OF *RICTULARIA* (NEMATODA) FROM AUSTRALIAN RODENTS

by PATRICIA M. MAWSON*

Summary

Two new species of *Rictularia*, the first of the genus to be recorded from Australia, are described. In *R. carstairsi*, from *Rattus villosissimus* (Northern Territory), the mouth is rounded; the female is up to 68 mm long, with cuticular spines (37-42 pre-vulvar, 17-35 post-vulvar) restricted to the anterior half or less; the male is 10.1-15.5 mm long, with 54-69 cuticular spines, and equal spicules 80-90 μ m long. In *R. mackerrasae* from *Rattus fuscipes assimilis* (northern Queensland) the mouth is slit-like and the buccal capsule dorsoventrally compressed; only females are present; these are up to 82 mm long, with cuticular spines (30-33 pre-vulvar, up to 11 post-vulvar) restricted to the anterior quarter or less of the body.

Introduction

There is no record of a valid *Rictularia* sp. from an Australian animal. *Rictularia disparilis* Irwin-Smith, 1922 was described from an Australian lizard but was placed by Dollfus and Desportes (1945) in a new genus *Pseudorictularia* and may be related to *Pneumonema tiliquae* Johnston.

However, the genus *Rictularia* is not uncommon in native rats. A large collection of male worms as well as females was recently given to me by Mr. J. Carstairs (Zoology Department, Monash University, Melbourne) who found them commonly in the long-haired rat, *Rattus villosissimus*, which he is studying. Dr. M. J. Mackerras has given me four collections from *Rattus fuscipes assimilis* from Northern Queensland. In *Rattus fuscipes murrayi* from Pearson Island, South Australia, *Rictularia* sp. was present in two of four rats dissected in 1969 and in one dissected in 1923. The specimens from the first two of these hosts are described in this paper, those from the third will be described shortly, with other nematodes from Pearson Island animals. I am most grateful to Dr. Mackerras and to Mr. Carstairs for providing the nematodes.

Rictularia carstairsi n. sp.

FIGS. 1-7

Host and locality; *Rattus villosissimus*, Brunette Downs Station, Northern Territory.

The collector, Mr. Carstairs, found the worms usually in the duodenum just behind the pyloric sphincter but sometimes in the stomach.

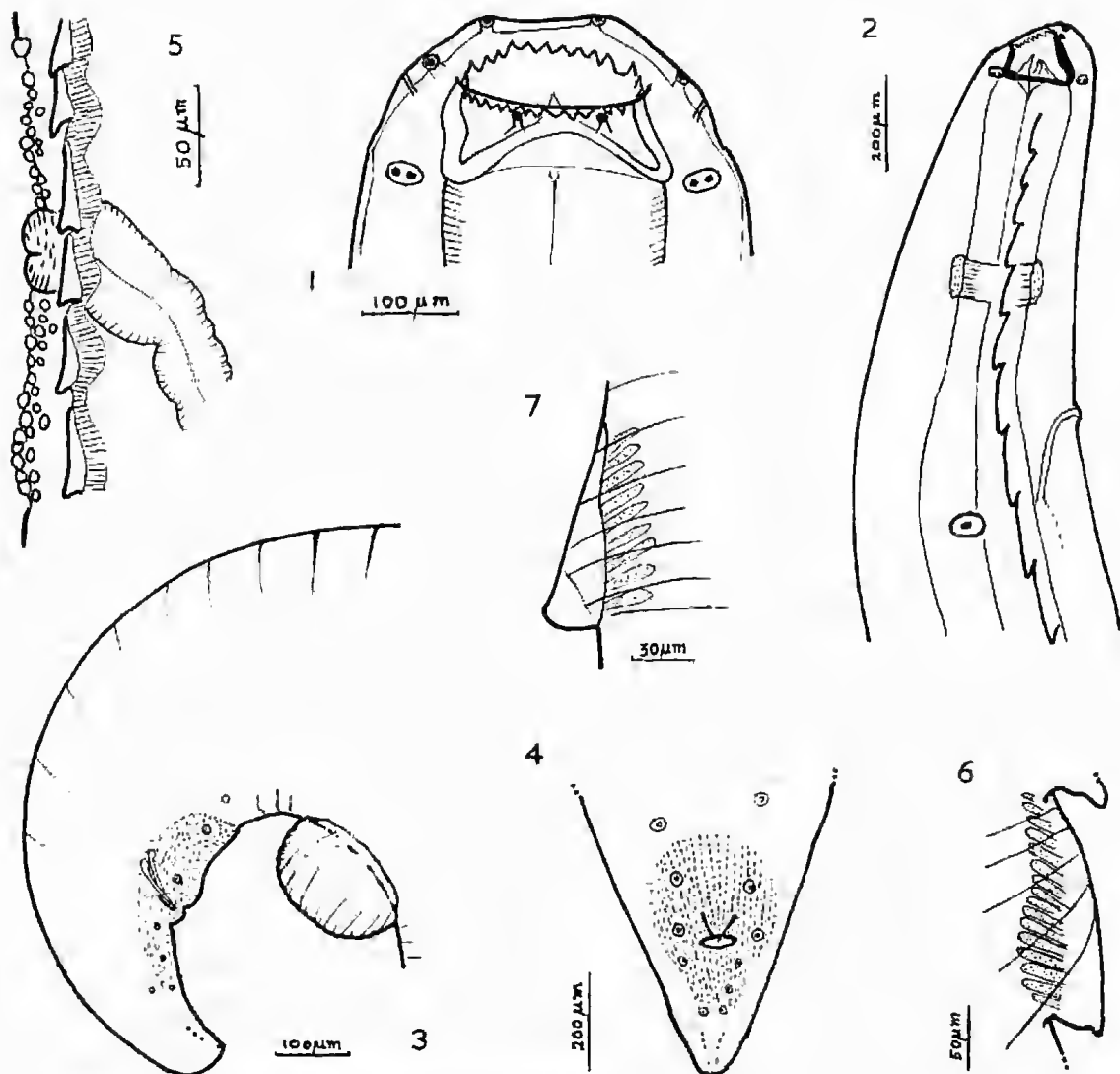
This is a very long species, the female worms reaching 68 mm, the males 15.5 in length.

Among about 150 females there are 15 males. Although the female worms are all very similar, two of the males differ from the other 13, and these are described separately. In all specimens the buccal capsule is wider than deep, its anterior border bears about 28-32 small pointed teeth (in both sexes), more or less evenly distributed around the edge. The mouth opening is at about 45° to the long axis of the worm. The head bears the typical cephalic papillae, an inner ring of six papillae and behind these four submedian double papillae. The amphids lie postero-dorsally to the lateral papillae of the inner circle. The excretory pore is slightly in front of, and the cervical papillae usually behind, the junction of glandular and muscular parts of the oesophagus.

In the female the sub-lateral spines do not extend as far as midlength of the body. The vulva, almost at the level of the posterior end of the oesophagus, is a transverse slit with salient lips, the cuticle for a short distance anterior and posterior to the vulva (but not on the salient lips) is raised into large irregularly disposed rounded bosses (Fig. 5). The pre-vulvar spines (37-42), are overlapping; the 17-35 post-vulvar spines become increasingly far apart, and after the first 10 they are very sparse and small, and the apparent variation in numbers is due probably to their small size.

In the male there are 54-69 pairs of spines extending from just behind the buccal capsule nearly to the cloaca. The first 35 pairs are overlapping, and have large thick bases; the rest become progressively further apart and more hook-like until in the last fifth of the body each is separated from the preceding by about a hook's length. There is usually one preanal

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Figs. 1-7. *Rictularia carstairsi*. 1, head, dorsal view; 2, anterior end, lateral view; 3 and 4, lateral and ventral views of male tail; 5, region of vulva, lateral view; 6 and 7, the fourth and most posterior cuticular spine respectively.

fan, but in one specimen there are two, and in another none. The spicules are equal or nearly so; a gubernaculum is present. The ventral body surface around the cloaca is raised into broken longitudinal ridges. The extent of these and the arrangement of the cloacal papillae are indicated in Figs. 3 and 4. It is much as postulated for the genus (at least for the species from rodents) by Tiner (1948) except that there is an extra pair of preanal papillae.

Measurements—Male: 10.1-15.5 mm long, diameter to 900 µm. Anterior end to cervical papillae 710-1115 µm (7th-9th spine), to nerve ring 380-550 µm; oesophagus 2.4-3.4 mm

(23rd-28th spine), its muscular part 480-750 µm. Spicule length 80-90 µm. Female: Length 35-68 mm, diameter to 1500 µm. Oesophagus 6.0-7.2 mm, its muscular part 1000-1250 µm. Anterior end to cervical papillae 1000-1250 µm (7th-9th spine), to nerve ring 590-800 µm, and to excretory pore 800-1050 µm. Tail 350-750 µm. Eggs 48-50 x 36-38 µm.

Among species of *Rictularia* of which the males have been described this one most closely resembles *R. harrisi* Baylis 1934. However, in *R. harrisi* the papillae of the male tail were not determined exactly, and the spicules are rather shorter. Among species of which the female only has been described, those with a

similar number of spines anterior and posterior to the vulva are *R. caucasica*, Schulz, 1927 and *R. magna* Kreis, 1937. The available description of *R. caucasica* does not allow detailed comparison. In *R. magna* there are only 18 denticles around the anterior border of the buccal capsule.

***Rictularia mackerrasae* n. sp.**

FIGS. 8-11

Host and locality: *Rattus fuscipes assimilis*, near Innisfail, northern Queensland.

Only females of this species are present in four collections. They were sent to me some time ago by Dr. M. J. Mackerras.

The worms are up to 82 mm long. The sub-lateral spines are restricted to about the first quarter (or less) of the body length; they are

small and even the most anterior spines are hook-like rather than imbricate; each is well separated from the next. There are 30-33 spines between the head and the vulva, and up to 11 behind this.

The mouth opening is directed dorsally, and the cuticle on its ventral margin is very thick; the ventro-lateral and lateral cephalic papillae of the inner circle have long peduncles traversing this cuticle. The two pairs of large sub-medial papillae of the outer circle are probably double, but this is not clear. The amphids lie close to the lateral cephalic papillae, slightly dorsal and posterior to them.

The buccal capsule and mouth are dorso-ventrally compressed. The dorsal oesophageal tooth is small and ventral teeth are absent. The nerve ring is at about midlength of the anterior muscular part of the oesophagus, the large

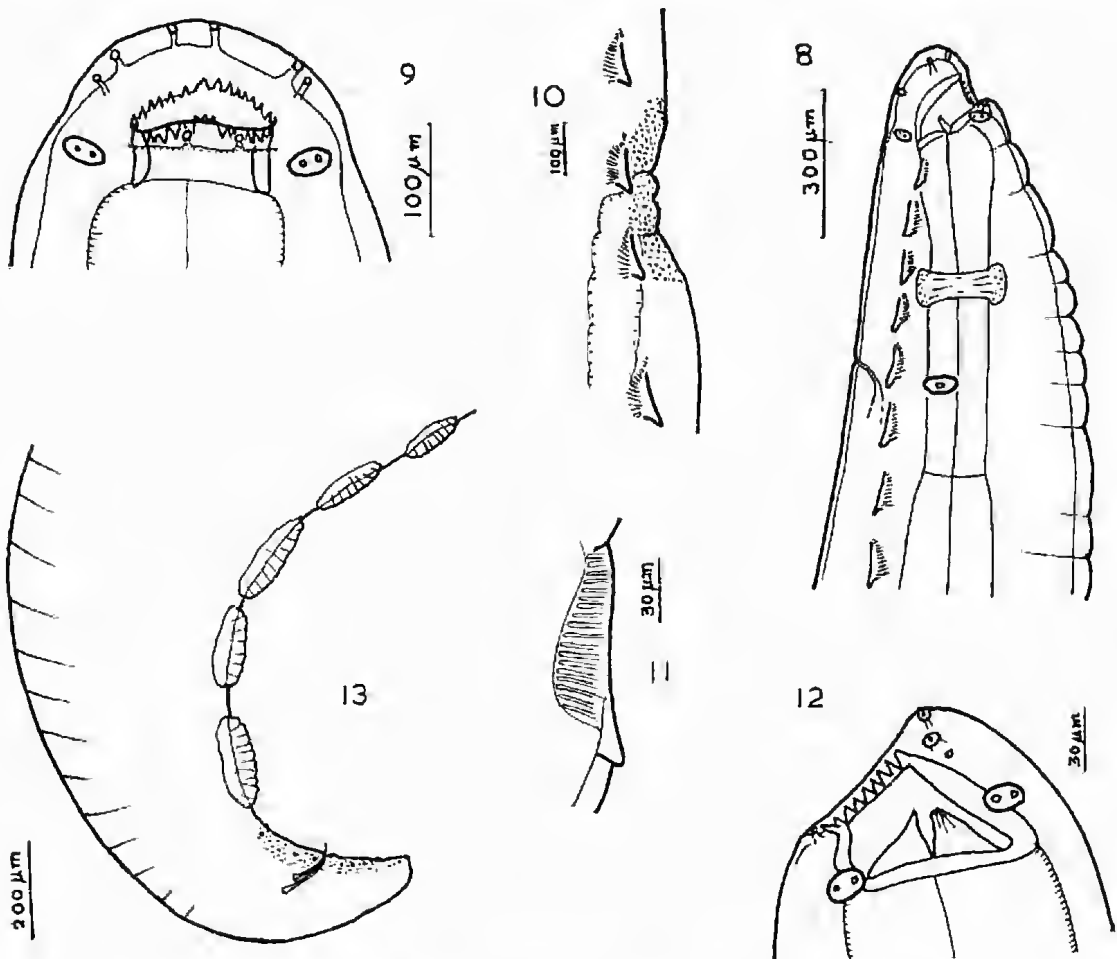


Fig. 8-11. *Rictularia mackerrasae*. 8, anterior end, lateral view; 9, head, dorsal view; 10, region of vulva, lateral view; 11, fifth spine from anterior end.

Figs. 12, 13. *Rictularia* sp. from *Rattus villosissimus*. 12, head, lateral view; 13, posterior end of male.

cervical papillae at three quarters its length (5th or 6th spine) and the excretory pore shortly in front of the cervical papillae.

The vulva is close to the posterior end of the oesophagus, it lies in a transverse depression of the body wall, and the lips are salient. The cuticle around, including the lips, is finely mammillated (Fig. 11).

Measurements—Female: length 65-82 mm; oesophagus 5.7-6.3 mm, its anterior muscular section 900-1300 μ m; distance from anterior end to nerve ring 500-700 μ m, to cervical papillae 810-1150 μ m, and to excretory pore 800-1000 μ m. Vulva 5.0-5.9 mm from head; eggs 46-50 x 30-31 μ m. Tail 530-550 μ m.

Tiner (1948) notes that *Rictularia* spp. in American rodents are of two types, one in which the oral opening is circular and more anteriorly directed (e.g. *R. coloradensis*) and another in which it is narrow, transverse and dorsally directed (e.g. *R. citelli*). Species from rodents belonging to the second type have been recorded from various parts of the world, *R. pruni* Seurat (Africa and Europe), *R. amurensis* Schulz and *R. strumica* Dimitrova, Genov and Karapchanski (Europe), *R. elvirae* Parona (Burma), *R. oligopectinea* Wu and Hu (China), *R. dhama* Inglis and Ogden (India) and *R. citelli* McLeod (? Syn. *R. halli* Sandground according to Tiner) from America. *R. mackerrasae* is now described from an Australian rat, it differs from others of the group chiefly in the number, size and arrangement of teeth on the anterior border of the buccal capsule.

Inglis and Ogden (1965) suggest that the extent to which the mouth is directed dorsally may depend on the degree to which it is opened or closed. This temporary movement however would not account for the greatly thickened cuticle anteriorly, or for the greater length of the median dorsal teeth on the anterior border of the buccal capsule, which appear to be associated with the more dorsal slit-like mouth in the species listed above. Moreover the fact that the condition is present in all specimens from a number of hosts of the same species in one locality (as is the case in the Australian specimens) suggests that it is a character with specific rather than temporary significance.

Rictularia sp.

FIGS. 12, 13

Host and Locality: *Rattus villosissimus*, Brunette Downs, Northern Territory.

Two male worms in the collection from this rat differed from those described as *R. carstairsi*, in that the spicules are distinctly unequal, the longer 145 μ m and 150 μ m, the shorter 70 μ m and 75 μ m, there are more preanal fans, three in one and four in the other. The worms are slightly shorter, 9.0 and 9.2 mm. Apart from these points, no real difference in the morphology from that of *R. carstairsi* can be found. As all the specimens from *Rattus villosissimus* had been put into one container, it is not known if these two males occurred alone, or with females and/or other males.

References

- BAYLIS, H. A. (1934).—On a collection of cestodes and nematodes from small mammals in Tanganyika Territory. *Ann. Mag. Nat. Hist. Ser.* 10, 13, 338-353.
- DOLLÉUS, R. P. and DESPORTES, C. (1945).—Sur le genre *Rictularia* Froelich, 1807 (Nématodes Spiruroidea). *Annls. Parasit. hum. comp.* 20, 6-34.
- INGLIS, W. G. and OGDEN, G. O. (1945).—Miscellanea Nematodologica V. *Rictularia dhama* sp. nov. from a squirrel in Nepal. *Zool. Anz.* 174, 227-231.
- IRWIN-SMITH, V. (1922).—A new nematode parasite of a lizard. *Proc. Linn. Soc. N.S.W.* 47, 311-318.
- KREIS, H. A. (1937).—Beiträge zur Kenntnis parasitischer Nematoda IV. Neue und wenig bekannte parasitische Nematoden. *Zentralbl. für Bakteriologie, Parasitenkunde* 1 Abt. Orig. 138, 487-500.
- SCHOLZ, R. E. (1927).—Zur Kenntnis der Helminthenfauna der Nagetiere der Union S.S.R. II. *Spirurata* Railliet et Henry 1914. *Travaux de l'Inst. d'Etud. de la Méd. Vét. Expér. Moscou* 14, 36-65.
- TINER, J. D. (1948).—Observations on the *Rictularia* (Nematoda: Thelaziidae) of North America. *Trans. Amer. Micro. Soc.* 67, 192-200.